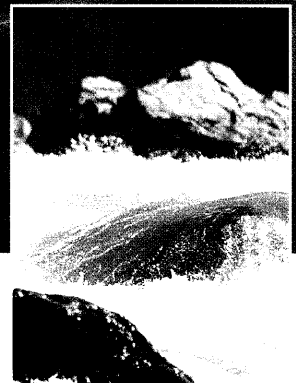
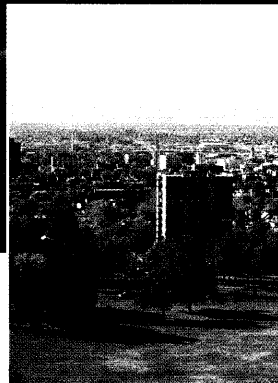


Maintaining Momentum On California Water Issues: Business Leaders' Findings

May 1996

Financing Options for Water-Related Infrastructure in California



Sponsored By

California Business Roundtable
California Chamber of Commerce
California Farm Bureau Federation
California Manufacturers Association

Maintaining Momentum On California Water Issues: Business Leaders' Findings

May 1996

SPONSORS

California Business Roundtable
California Chamber of Commerce
California Farm Bureau Federation
California Manufacturers Association

ACADEMIC PANEL

Primary Drafters

David Mitchell and Steven Moss, Partners,
M.Cubed Private and Public Policy Analysts

Oversight Committee

Douglas Parker, Extension Economist, Department of Agricultural
and Natural Resource Economics, University of California, Berkeley

Michael Hanemann, Professor of Agricultural and Natural
Resource Economics, University of California, Berkeley

Dwayne Banks, Assistant Professor, School of Public Policy,
University of California, Berkeley

The sponsors wish to thank the Academic Panel that drafted Financing Options for Water-Related Infrastructure in California. They also wish to express their appreciation to the following individuals and their organizations for bringing together the focus groups whose assistance brought a broad range of perspectives to the study development process:

Richard Golb, Northern California Water Association
Sunne McPeak, Bay Area Economic Forum
Brent Graham, San Joaquin Valley Agricultural Water Committee
Joan Anderson, Southern California Water Committee
Kathy Neal, Kneal Resource System
Gwen Moore, Former Assemblywoman, GeM Communications Group
Bob Potter, California Department of Water Resources

The sponsors also thank the numerous individuals who participated in the focus group process.

Executive Summary	v
Financing Options for Water-Related Infrastructure in California	1
Introduction	1
Framework for Financing Water Infrastructure	4
Alternative Revenue Sources for Water Infrastructure Finance	8
Institutional Alternatives for Financing Water-Related Infrastructure	17
Water Industry Restructuring	25
References	31
Glossary of Water Terms	32

In recognition of the substantial unmet water infrastructure needs throughout California, in early 1995 the California Business Roundtable, California Chamber of Commerce, California Farm Bureau Federation, and the California Manufacturers Association initiated a process to explore feasible approaches to financing needed water infrastructure. The project sponsors first enlisted a panel of academics with expertise in the subject to develop a draft issues paper outlining possible financing alternatives. Then, through a series of statewide focus groups, the academic draft was distributed and critiqued by stakeholders. That initial draft and those meetings provided the basis for the findings contained in this paper.

The business-group sponsors undertook this project in response to the increasing risk to all sectors of the California economy from ongoing under-investment in the state's water infrastructure. Water-related infrastructure investment needs are growing rapidly as a result of a growing population and economy, environmental and public health requirements, and aging water delivery systems (see California Water Plan Update, Bulletin 160-93, California Department of Water Resources). These pressures have given rise to the water policy priorities of increasing water supply reliability, water quality, and ecosystem quality, as well as reducing Bay-Delta system vulnerability (see CALFED Bay-Delta Program, Phase I Progress Report). Achieving these objectives may require billions of dollars of new water-related infrastructure during the next decade. Methods to finance needed projects must be developed now if the state is to meet its future water demands.

Development of this report has occurred within the context of a variety of statewide water initiatives. Its preliminary findings have already contributed to a number of related financing efforts, including the CALFED Bay-Delta process, California Senate Bill (SB) 900 discussions, and associated activities designed to streamline the state's water transfer laws. The sponsors hope that these efforts and this paper will help maintain existing momentum toward comprehensive solutions to California's water needs.

Key report findings can be separated into four primary areas: (1) principles that provide a basis to develop effective and equitable water financing solutions; (2) financing alternatives to support Bay-Delta infrastructure; (3) financing alternatives to support statewide water infrastructure; and (4) a proposed method to initiate a process to better understand, and potentially utilize, private methods of financing public infrastructure (i.e., privatization).

Principles for Water Infrastructure Financing

A reexamination of financing approaches to water infrastructure is needed because (1) water users perceive a mismatch between their expenditures for water projects and the benefits they receive; (2) when allocating project costs, the distinction between benefits that should appropriately be paid for by the general public versus those that are best financed by private parties

has become increasingly blurred; and (3) the costs associated with new types of project benefits — such as improved supply reliability — are more difficult to allocate among users with traditional approaches. These factors have contributed to a voter reluctance to authorize general obligation bond financing and an unwillingness on the part of water users to commit to additional fees for necessary infrastructure improvements.

This paper supports the fundamental principle that those who receive project benefits should be responsible for funding project costs (i.e., a benefits-based approach). Based on this understanding, the following principles for financing water-related infrastructure should be adhered to:

- A comprehensive needs and benefits assessment should be an integral part of every project planning process. Because needed infrastructure projects, particularly in the Bay-Delta, are likely to be phased in during a number of years, project prioritization should be determined by rigorous needs and benefits assessments.
- Project financing and repayment policies should be developed to ensure that, to the greatest extent possible, those who receive project benefits pay for project costs. Project repayment policies should be carefully scrutinized to ensure that arbitrary cost allocations and subsidies not occur.
- General obligation (GO) bonds are an appropriate mechanism to fund costs associated with benefits widely provided to the general public. Although it may be difficult to allocate costs associated with projects engendering both public and private benefits, any tendency to over-allocate project costs to general taxpayers should be avoided. The use of general obligation bond financing supported by property assessments and general tax revenues should be used to recover costs associated with accurately identified public project benefits.
- To the extent possible, market mechanisms should be relied on to recover project costs. For example, costs associated with private benefits should be recovered through appropriate commodity charges and user fees.
- Likewise, to the extent possible, costs associated with projects that provide shared benefits to defined user groups should be recovered using appropriate user fees and access charges.
- Cost-recovery policies should include enforceable sunset provisions to ensure that revenues are used only for the purposes and durations intended. Sunset provisions could be linked to bond covenant requirements or other appropriate criteria.

In recommending market-based approaches to water infrastructure financing, the sponsors believe that issues related to equity and the distribution of benefits should not be neglected. Market-based approaches should be crafted and implemented so as to be fair as well as efficient.

Alternatives for Financing Bay-Delta Infrastructure

Financing solutions for Bay-Delta infrastructure should recognize the benefits associated with various project components, and recover costs commensurate with the benefits produced. For example, to the extent possible, costs associated with carefully defined public benefits should be recovered through publicly supported general obligation bonds and federal cost sharing. Likewise, costs associated with Bay-Delta projects providing more reliable or additional water supply or other private benefits should be recovered from direct beneficiaries through water charges and user fees.

Given the scope of potential Bay-Delta infrastructure needs, a variety of financing approaches will be required — including federal cost sharing, private funding, and enterprise revenue financing. Three basic alternatives that are likely to play key roles in Bay-Delta financing are federal funding, general obligation bonds, and user fees.

- **Federal Funding** should be obtained to meet the commitments and obligations of the federal government. The State of California should seek federal funding for appropriate water projects and programs. This funding source should be directed toward water projects that produce broad public benefits, including the federal share of CALFED implementation.
- **Bay-Delta General Obligation Bonds** should be directed toward defined public benefits. A half-decade of public reluctance to approve GO bonds underscores the need to insure that this financing tool is carefully targeted to fund well-defined benefits provided to the public.

To the extent that GO bonds and other financing sources are not forthcoming to fund all necessary broad-based public benefit projects, a **Bay-Delta User Fee**, agreed to by stakeholders, against diversions from the Bay-Delta and its tributaries could be used to supplement financing for project benefits accruing broadly to those receiving water from the Bay-Delta.

- A Bay-Delta water user fee could be used to recover the portion of a project's costs that directly benefit those Californians who divert water from the Bay-Delta and/or its tributaries.
- User fees could be structured to account for mitigation payments currently being made by various water users, such as CVPIA restoration fund payments.
- User fees are commonly employed to finance a wide range of public infrastructure — such as ground, air, and water transportation infrastructure — but have been relied on to a much lesser extent for financing water facility costs associated with the provision of public or shared benefits.

New institutions also may be needed to appropriately administer Bay-Delta financing mechanisms. For example, a **Bay-Delta Financing Authority** could be established to coordinate financing for Bay-Delta project costs related to public and widely shared benefits, to solicit funds from federal and State agencies, and to administer any Bay-Delta water user fee revenue. The Authority could also provide a mechanism to facilitate and coordinate the work of existing agencies.

- The Authority could act as a coordinating body, allowing agricultural and urban interests — as well as government agencies — to pool their resources to fund projects that provide shared and public benefits. This approach could provide agencies that are funding project improvements in the Delta greater financial control over project funds.
- The Authority could encourage flexible and early financing of Delta improvement projects. For example, a **Mitigation Credit Bank** could be established to encourage early support for Bay-Delta improvement projects by providing financial credits toward long-term Bay-Delta cost obligations to stakeholders willing to make early investments in the Delta.
 - A credit mechanism would encourage agencies and others to make early investments in Bay-Delta improvement projects, such as Category III programs, by reducing the long-term financial risks associated with these investments. Through a Mitigation Credit Bank option, early investments could be credited against long-term project liabilities.
 - A Mitigation Credit Bank could also provide a vehicle for private-initiative environmental mitigation programs. For example, the Credit Bank could match user groups seeking long-term mitigation credits with local Delta landowners to create community-based habitat improvement programs. For example, a Delta landowner who creates a levee improvement program consistent with CALFED recommendations could receive financing from a Southern California water utility. In return, the water utility would receive credits toward future project cost liabilities.
 - Credits could be financed in a number of ways, including through the issuance of State general obligation bonds (e.g., SB 900 could include provisions to fund a credit program); from Bay-Delta user fee revenue; or as part of any comprehensive repayment proposal developed by CALFED.
- The Authority could be placed under the auspices of a statewide oversight group, representative of the diversity of water interests, to provide general management and review of Authority actions.
- As CALFED recommendations for infrastructure projects in the Bay-Delta will be phased in gradually, the Authority could be in a position to

provide ongoing project financial planning to assure an appropriate level of financing coordination and continuity across projects.

Alternatives for Improving Access to Investment Capital

As with the Bay-Delta approaches, new financing mechanisms and institutions may provide useful tools as part of strategies to increase access to needed investment capital. For example, if specific benefits could be realized, a **State Water Infrastructure Bank** could be created to coordinate and consolidate existing water-related State local assistance programs. The Bank would most appropriately focus on public benefits that are not readily revenue-financed. Such consolidation could streamline government programs, reduce bureaucracy, and improve access to capital.

- Such a bank should be developed only after an audit of existing loan and matching-fund programs is completed to ensure the effectiveness of and need for current and future programs.
- The Bank could provide technical assistance, loans, grants, and bond pooling services to local public and private water service providers for water supply, conservation, drainage, and environmental-mitigation capital projects.
- The Bank could achieve capital cost savings for local water service providers by reducing debt-related overhead costs and using the State's credit to gain wider access to capital markets. Moreover, the Bank could provide local agencies a degree of assurance that capital funds will be available when needed to initiate cost-justified projects.
- The Bank could establish project funding criteria to allocate limited State funds. Criteria could include project importance with respect to public health and safety, project impact on the environment and/or economy, community wealth, and the ability to repay project loans.
- The Bank could be operated under the auspices of an existing State agency, such as the Department of Water Resources, the Department of Finance, or the Debt Advisory Commission.
- Several approaches could be employed to finance an infrastructure bank. For example, GO bonds, user fees, or water utility surcharges on agricultural and urban retail water sales could be used to support bank activities.

New Directions for Restructuring California's Water Resources

A **Blue Ribbon Commission on Water Industry Restructuring** should be appointed by the Governor to further study the operating and capital efficiencies that could be realized through *appropriate* restructuring of public services. As part of its charge the Commission should establish

guiding principles for the transfer of public assets to local entities and the private sector where such transactions are determined to be in the public interest.

- The U.S. Environmental Protection Agency believes that well-structured public-private partnerships offer local agencies opportunities to mitigate the rising costs of environmental compliance (U.S. Environmental Protection Agency, 1990b). However, specific guidelines on how to examine and evaluate privatization initiatives have yet to be developed.
- Potential benefits of privatization include: (1) construction cost savings, (2) capital cost savings, (3) reduced public sector risk, (4) increased tax revenue, (5) increased debt capacity, and (6) operating cost savings.
- To be successful, private-public partnerships should be structured so as to accommodate varying degrees of public and private sector involvement. Though privatization in some cases may increase project efficiencies, it should not be pursued at a cost to the public welfare.
- The Commission should also study the ability to use State and federal water transmission facilities as common carriers to facilitate water transfers and any efficiency improvements in water allocation that could be gained from this approach.

Ensuring adequate water infrastructure finance is of the utmost importance for the economic strength and environmental integrity of California. The report's sponsors hope that the above alternatives, appropriately shaped and implemented, will help ensure that sound fiscal principles are used in water infrastructure development, and will help to provide an appropriate framework for financing California's water needs into the next century.

The 1987-92 drought, more than any other recent event, underscored the limits of the state's existing water supply and delivery system, both in terms of its ability to meet a burgeoning population's water demands, and its ability to provide adequate safeguards and protection to the state's aquatic ecosystems. The drought brought an immediacy to what is fundamentally a long-term dilemma facing the state: How can California best meet the growing water demands of its people and economy while ensuring the health of its water resources and associated ecosystems? California is struggling to find an answer to this complex question and is in the midst of changing the way it allocates, manages, and uses water. New balances between competing agricultural, urban, and environmental uses are being struck; more stringent water quality protections are being implemented; new conservation and reclamation technologies are being adopted; and innovative water management and allocation strategies are being pursued. California is entering a new water resource era, where a premium is placed on careful stewardship and rational allocation of its water resources.

As California moves into this new era of water management, it will have to reengineer as well as rethink the way in which water is used. As the drought made abundantly clear, the state's existing water infrastructure is not fully capable of meeting the state's water resources needs. A number of factors are combining to dramatically increase the demand for water-related infrastructure investments in California. These include the following:

- ***Compliance with environmental requirements:*** Safe Drinking Water Act (SDWA) compliance is expected to increase municipal water supply capital expenditures by 15 to 25 percent, on average, during the next decade (Beecher, Mann, & Stanford, 1993). Clean Water Act (CWA) compliance costs are expected to be even larger, constituting some 90 percent of the total costs for clean water, according to the U.S. EPA (U.S. Environmental Protection Agency, 1990a). Nationwide, aggregate water treatment and water quality costs associated with federally mandated water quality requirements are estimated to approach \$158 billion for the period 1988 to 2000 (Beecher, et al., 1993).¹ Federal funding of these mandates will cover a portion of the cost. Nevertheless, California's share of this total could easily reach \$20 to \$40 billion.
- ***Deferred maintenance and depreciation:*** In addition to new water quality requirements, federal, State, and local water suppliers have deferred

¹ This estimate includes costs for point-source and non-point-source pollution control and is based on *Environmental Investments: The Cost of a Clean Environment* (Washington, DC: U.S. Environmental Protection Agency, 1990).

maintenance and/or replacement of aging facilities to the point where they are beginning to experience sharp operational and maintenance cost increases. Nationwide, it has been estimated that cumulative costs could range between \$36 and \$70 billion during the next two decades (Schnare & Cromwell, 1990). California's share of this total could amount to between \$4 and \$8 billion.

- ***Bay-Delta Agreement:*** Wildlife habitat and species protection efforts, particularly in the Bay-Delta, are likely to engender significant infrastructure investments. For example, potential long-term Bay-Delta habitat protection and water quality improvement options identified in the State Water Plan include dual transfer facilities for agricultural and urban water exports, a by-pass canal, fish screening systems, and agricultural drainage diversion systems (California Department of Water Resources, 1993). The December 15, 1994, Bay-Delta Agreement calls for an initial \$180 million in environmental restoration projects during the next three years. The CALFED Bay-Delta Program (CALFED), charged with developing a long-term plan to implement the Agreement, anticipates that any long-term water quality solutions are likely to have a significant capital component (McReynolds, 1995). Although total costs associated with Bay-Delta actions are highly uncertain at this time, they could approach several billion dollars.
- ***Development and management of supply:*** California is currently changing the way it manages water. In addition to developing storage facilities, water transfers, conjunctive use, reclamation, and conservation are becoming integral parts of the state's water management efforts. Substantial infrastructure investments will be required before the full potential of these options can be realized. For example, the Department of Water Resources projects that the state's reclamation capacity will exceed 1.3 million acre-feet by 2020 (California Department of Water Resources, 1993). However, most of the facilities needed to reach this target have yet to be constructed. The ability to transfer water or conjunctively use groundwater north of the Delta also is limited by existing facilities. According to the recent State Water Plan update, "California's water supply infrastructure is severely limited in its capacity to transfer marketed water through the Delta" (California Department of Water Resources, 1993).²

Financing state and local water infrastructure will constitute a major challenge for California. Historically, California has relied on four primary sources to finance its water infrastructure needs: (1) federal grants and cost-sharing; (2) State general obligation (GO) bonds backed by State general funds; (3) local general obligation bonds; and (4) enterprise revenue-backed securities. Local water projects — such as local distribution and treatment facilities — have been financed mostly through the use of local general obligation bonds, developer fees, and enterprise revenue-backed securities. For the most part, these approaches continue to work well for most agencies. At the same time, state and regional projects have relied much more extensively on State and federal

² The State Water Project, for example, remains uncompleted.

funding sources. In particular, State and federal funding has been the principal source for financing public benefit components of water projects — such as flood hazard protection, wildlife habitat enhancement and protection, and extensive water-based recreation opportunities. For a variety of reasons, the state's ability to rely on traditional funding sources outlined below has become much more uncertain.

- ***Federal grants and cost-sharing:*** Since the early 1980's the federal government has been shifting the responsibility for planning and financing large-scale water resources projects to State and local governments.³ With ongoing efforts to balance the federal budget and reduce the deficit, it is likely that federal participation will be limited.
- ***State general obligation bonds:*** Three factors have combined in recent years to make GO debt financing more difficult. First, water-related infrastructure increasingly must compete for limited State general funds with a host of other pressing infrastructure and social needs, including transportation, schools, prisons, and disaster relief. Second, State per capita debt has quadrupled since 1985 and debt service as a percent of total State expenditures has more than tripled. As a result of this rising debt, as well as State budget impasses, the State's credit has been downgraded several times since 1990, raising borrowing costs. Finally, during the weak economy of the 1990's, voters appeared to have grown weary of State GO bond measures appearing on ballots, defeating 18 of the last 25, including the Water Resources Bond Act of 1990, which marked the first time the state's electorate failed to approve a water infrastructure State GO bond measure. Nevertheless, during the March 1996 elections, two GO bonds for education and seismic upgrades did pass, demonstrating that this form of financing remains available for well-defined projects with demonstrable public benefit.

Traditional funding sources will continue to be a part of the capital structure of most water-related infrastructure projects; very few new financing mechanisms are available for this purpose. However, the mix of financing approaches used, and the way in which they are implemented, must be crafted to match the state's emerging water needs.

Purpose of Paper

This paper addresses three issues related to water infrastructure finance, as follows:

First, the paper provides a general approach to financing water infrastructure — a benefits-based approach — and recommends a process to ensure appropriate project financing.

³ Prior to 1970, the federal government was the primary source of funding for most types of large-scale water resource projects. The federal share of cumulative government expenditures for water resource development equaled 76 percent for irrigation uses, 59 percent for industrial uses, and 74 percent for hydropower uses. Federal participation at the local level was and continues to be much less important. In 1982, all federal support for river basin commissions, the Water Resources Council, and direct water resource planning grants to states was eliminated. State and local government cost-sharing responsibility for wastewater treatment construction was increased from 25 to 45 percent (Smith, 1985).

Second, the paper discusses potential project-specific revenue sources — including user/commodity charges, license fees, special taxes, and general taxes — in the context of the general approach advanced in the paper's first part, and discusses likely key financing alternatives.

Third, the paper addresses the potential need for reinvigorated institutional structures to coordinate project financing. The paper discusses the benefits that could be engendered by a Bay-Delta Financing Authority to coordinate long-term Bay-Delta-related project financing; a statewide Water Infrastructure Bank to provide financing assistance to local water agencies; and a Blue Ribbon Commission on Water Industry Restructuring to further study the operating and capital efficiencies that could be realized through appropriate privatization of public services and to establish guiding principles for the transfer of public assets to the private sector in cases where this is determined to be desirable.

This paper seeks to stimulate the establishment of policies intended to ensure that California's critical water infrastructure needs are met. While the paper provides a general framework for implementing its key concepts, it is recognized that political consensus among stakeholders — agricultural, urban, and environmental — will need to be built to structure and implement any final policies.

Project financial planning must be an integral part of project planning and development. After infrastructure requirements are defined and during project development, successful financing strategies consist of five inter-related components, as follows:

1. *Determine project funding needs (i.e., how much is needed).*

Funding requirements should be based on a comprehensive project needs and benefit-cost assessment.⁴ For example, the CALFED Bay-Delta Program is undertaking a needs assessment to implement the Bay-Delta Agreement. The assessment should consider project scope and scale, determine associated costs and benefits, and identify direct and indirect project beneficiaries.

2. *Identify cost responsibility (i.e., who pays how much).* All water resource project costs must be borne by someone: (1) direct beneficiaries, (2) indirect beneficiaries, (3) State and local governments, and/or (4) the federal government. Project financing and repayment policies should as nearly as possible correlate associated project benefits and costs, and recover project costs accordingly. Project repayment policies should be carefully scrutinized for arbitrary cost allocation and subsidization.

⁴ Although an obvious economic efficiency requirement, there are numerous examples of public infrastructure investments where incomplete analysis formed the basis for determining project costs, either because difficult-to-quantify costs and benefits were excluded from the evaluation, or because of political considerations. Non-market benefits and costs, in particular, require careful consideration, because they are difficult to quantify, yet are likely to be a pervasive aspect of most new water infrastructure projects.

3. **Determine cost-recovery mechanisms (i.e., how revenue is collected).** There are a number of ways to collect revenue from project beneficiaries. Commonly used revenue mechanisms include water and power fees, standby/availability charges, impact fees, recreation fees and licenses, commercial fees and licenses, special assessments, special taxes, sales taxes, income taxes, and property taxes.⁵ As discussed later in this paper, revenue instrument choice should primarily be a function of the type of cost being recovered and the cost-recovery powers of the project sponsor.^{6,7} In some instances, appropriate cost recovery may entail the creation of a new authority or institution (e.g., the creation of a Joint Powers Authority to finance a project with widespread regional benefits).
4. **Develop project capital structure (i.e., how the project is financed).** Capital structure refers to the mix of funding sources and repayment obligations used to pay for a project. Typically, a large-scale project's capital structure will include a combination of front-end capital payments and medium- to long-term debt obligations. For example, a groundwater recharge project's capital structure might consist of up-front capital (including grants and contributions), State low-interest loans, and revenue bond obligations. Financing options will largely depend on steps (2) and (3).⁸
5. **Include a financing "sunset."** Cost-recovery policies should include sunset provisions to ensure that revenues are used only for the purposes and duration intended. Sunset provisions could be linked to bond covenant requirements or other appropriate criteria.⁹

Linking Project Benefits to Revenues

The determination of project benefits is integral to defining appropriate financing mechanisms. Water projects typically generate three distinct types of benefits: economists refer to these as (1) "private goods," (2) "common-property goods," and (3) "public goods." For example, a groundwater recharge facility might produce water for sale (a private good), unrestricted fishing opportunities (a common-property good), and wildlife habitat enhancement (a public good). Table 1 provides additional examples of each type of benefit common to water projects of one sort or another. The table also identifies revenue sources and financing mechanisms appropriate to each type of benefit.

⁵ For a more comprehensive listing of revenue mechanisms, see (McReynolds, 1995).

⁶ User fees and commodity charges, for example, are appropriate for recovering costs associated with providing project outputs that readily can be sold, such as municipal and irrigation water, or improvements to water quality. Broadly based taxes are appropriate for recovering costs for public benefits that cannot readily be sold, such as habitat improvement.

⁷ The jurisdiction and authority of the federal government, for example, affords it very different financing and cost-recovery powers than are available to a state or local government. Likewise, the limited jurisdiction and authority of a special district or private enterprise may significantly restrict it from recovering project costs that confer widespread benefits.

⁸ For long-lived water projects, debt is usually preferable to pay-as-you-go financing for several reasons. First, the use of debt permits those who will benefit from a long-lived project to pay for it, which enables more capital to be raised than would be possible out of current revenue alone. Second, fairness dictates that the total cost of a long-lived project should not be charged solely to current users or to those who happen to live in the area during the time that the project is constructed and financed. Debt financing permits project costs to be shared with those who will benefit from it in future years. Third, debt financing allows a locality to better coordinate project repayment with its revenues and to smooth out repayment even if project costs occur unevenly.

⁹ For example, most bridge tolls have long ago recovered the original capital costs of construction. Toll revenue is now used for other transportation-related activities.

It is important to understand the distinction among the three primary categories of goods so that financing methods can be appropriately matched, as follows:

- “Private goods” include all those commodities that are bought and sold in a market. Private goods generally can be sold to customers at a price sufficient to recover their associated costs, enabling the use of various types of debt financing supported by contract sales. Investment in private-goods development is the basis for most enterprise revenue bond financing.
- “Common-property goods” represent resources from which individuals cannot be excluded, but whose use disrupts the resources’ availability to others. For example, although all drivers are free to use California’s roads, the addition of one more automobile during rush hour can cause increased delays for everybody else on the road. Common-property goods are much more difficult to price and sell than private goods. However, if common-property beneficiaries are convinced of the benefits they will receive, costs can be recovered with access fees or user charges, which in turn can support debt financing. For example, revenue from parking, camping, and other recreation-related fees can be used to recover costs associated with providing recreational areas. Similarly, fishing license fees or taxation of complementary goods (e.g., fishing equipment) can be used to recover costs associated with the use of open-access commercial and sports fisheries.
- “Public goods” are resources that cannot be supplied by markets, and for which individuals cannot be excluded. For example, all citizens benefit from national defense. Public goods give rise to the “free-rider” problem. A free-rider is one who refuses to pay his share, hoping that others will pay for the entire project. As a result, the free-rider obtains a free good; once a public good is created, no one can be excluded from its use or enjoyment. Because of the free-rider problem, those desiring the public good may be discouraged from organizing themselves to produce it, knowing that free-riders will exist. There is also likely to be debate about how much of a public good to provide. This is a dilemma that must be resolved by government, stakeholders, and the public. Some form of collective repayment — such as local assessments or broad-based taxes — generally is necessary to recover costs associated with the provision of public goods.

TABLE 1
FINANCING OPTIONS FOR WATER-RELATED INFRASTRUCTURE IN CALIFORNIA
PROJECT BENEFITS DISCUSSION

1. Flood hazard reduction 2. Species protection 3. Broad-based economic development	1. Property assessments 2. Special taxes 3. General taxes	1. General obligation bonds 2. Special-general assessment bonds
1. Recreation 2. Commercial/sports fisheries 3. Delta water quality	1. User charges (e.g., per-AF surcharge for water quality improvements) 2. Access fees/licenses (e.g., fishing license/boat ramp fees/parking fees) 3. Taxation of complementary goods (e.g., taxes on fuel/recreation equipment)	1. Self-liquidating general obligation bonds 2. Revenue bonds 3. Certificates of participation 4. Privatization
1. Manufacturing and industrial water supply/reliability 2. Agricultural water supply/reliability 3. Hydroelectric power supply	1. User/commodity charges 2. System development charges	1. Self-liquidating general obligation bonds (e.g., State Water Project GO bonds) 2. Revenue bonds 3. Certificates of participation 4. Contributions-in-aid-of-construction 5. Privatization

Financing Framework Recommendations

- A comprehensive needs and benefits assessment should be an integral part of every project planning process. Because needed infrastructure projects, particularly in the Bay-Delta, are likely to be phased in during a number of years, project prioritization should be determined by carefully developed needs and benefits assessments.
- Project financing and repayment policies should as nearly as possible ensure that those who benefit pay the costs.
- To the extent possible, market mechanisms should be relied on to recover project costs. Costs associated with private-good benefits should be recovered through commodity charges and user fees.

- Although it may be difficult to allocate costs to private-good and common-property beneficiaries, the tendency to over-allocate project costs to public goods should be avoided. General tax revenues and general obligation bond financing supported by property assessments should be used to recover costs associated with accurately defined public-good project benefits.
- Cost-recovery policies should include sunset provisions to ensure that revenues are used only for the purposes and duration intended. Sunset provisions could be linked to bond covenant requirements or other appropriate criteria.

Once a comprehensive project needs and benefits assessment has been developed, project revenue sources should be identified. As indicated in Table 1, the choice of a revenue source should be determined to a large extent by whether the project benefit under consideration is a private good, common-property good, or public good.

Funding Common-Property and Public-Good Benefits

User fees, general tax revenues, and special assessments are commonly used to finance the common-property and/or public-good elements of public infrastructure. For example, user fees are used to support bridges through tolls, recreational areas through parking and camping permits, and airports through landing fees. Table 2 displays examples of existing use-based fees employed to support common-property goods and/or infrastructure. Likewise, general tax revenues and special assessments are commonly used to finance public goods such as schools, libraries, and transportation systems.

TABLE 2
EXISTING USER FEES

Automobile fuel taxes	Revenue is used for statewide transportation infrastructure and in some cases for environmental mitigation.
Automobile registration fees	Revenue is used for statewide transportation infrastructure and in some cases for environmental mitigation.
Bridge and toll roads	Revenue is used for local transportation infrastructure.
Airport landing fees	Revenue is used for local airport infrastructure.

User fees have not been extensively employed to finance common-property and public-good benefits of water-related infrastructure. Historically, the majority of water project costs associated with the provision of common-property goods have been recovered through federal cost sharing and State general obligation bonds supported by federal and State tax revenue, respectively. Given current budget deficits, this type of funding can only be obtained if its need can be clearly demonstrated.

Even if this were not the case, from an economic efficiency viewpoint, it is not obvious that general tax revenue funding sources should be extensively relied on to recover common-property project costs. Where benefits and specific beneficiaries can be determined, access and user fees or indirect commodity charges — such as a fee on water diversions — can serve the dual purposes of promoting more efficient use of resources and recovering project costs associated with the provision or enhancement of common-property goods.

Harnessing Local and State General Tax Revenue

General tax revenues are appropriate for financing properly defined public-good project elements that confer multi-regional or statewide benefits. For example, Bay-Delta investments that improve the general environmental integrity of the state's fish and wildlife resources may be appropriately financed through general tax revenues. These revenues may be derived from a variety of tax sources, depending on the project sponsor's revenue base, including property taxes, land taxes, sales taxes, income taxes, and excise taxes. General tax revenues can be used to secure general obligation bond project financing.

Region-specific benefit-based assessments are appropriate revenue sources for financing public-good project elements that confer identifiable regional benefits. For example, flood hazard-reduction projects for specific regions may be appropriately financed with benefit-based assessments. Benefit-based assessment revenues can be used to secure special-general assessment bond or Certificate of Participation-type project financing.

An Alternative Approach: Bay-Delta User Fees

The Delta

The San Francisco Bay-Delta constitutes the heart of California's vast water resources and, as such, has both regional and statewide importance. The Bay-Delta supports a myriad of plant and wildlife habitats, provides a conduit for anadromous fish to travel between streams and oceans, and regulates the zones between fresh and salt waters. The state's urban and rural populations depend on the Bay-Delta to irrigate millions of farmland acres and to provide needed water for manufacturing and industrial processes. Perhaps most important, the Bay-Delta is a primary source of drinking water to two-thirds of California's population.

The Bay-Delta's importance to California's environment, public health, and economy makes it the focus of efforts to ameliorate water quality and ensure water supply reliability. These efforts are expected to require significant investments in water infra-

structure. The Bay-Delta Agreement calls for \$180 million in environmental restoration projects in the next three years alone. Because of the Bay-Delta's importance to all of the state's citizens, investments in it will engender both regional and statewide benefits.

Water-related infrastructure investments in the Bay-Delta, in particular, are likely to confer significant common-property benefits on a multi-regional or statewide basis. One method of financing such investments is through the implementation of user fees for water diversions based upon users paying for benefits received. A user fee would draw revenues from those Californians who directly benefit from water diversions from the Bay-Delta and/or its tributaries.¹⁰

Under a user fee policy, a per-acre-foot assessment would be placed on water diverted from the Delta and its tributaries. Alternatively, the user fee could consist of a combination of fixed "access" fees and graduated use charges. The overall fee level could be set to finance Bay-Delta infrastructure needs that confer broad-based common-property and/or public-good benefits. To the extent possible, fee-financed project elements should be identified prior to fee implementation. To this end, the ongoing CALFED process may ultimately result in a project-by-project assessment of water infrastructure requirements on which fee levels could be based. (To the extent that fees required are in excess of benefits derived, a process should be set up to equitably deal with this issue.)

The same fee could be assessed on all water users, or a fee schedule that differentiated rates based on specific criteria could be developed. A uniform fee schedule would imply that the costs incurred and benefits received by users are generally equal and that there are no other mitigating reasons to charge users different rates. However, there are a number of factors that indicate that it may be desirable to implement a differentiated fee schedule. For example, the economic impacts of a fee would differ across populations, as would the ability of users to pay fee expenses.¹¹

In this vein, a Bay-Delta water user fee schedule could reflect a number of characteristics, as follows:¹²

- **Current fee structure.** Current fees paid by Bay-Delta water users, such as CVPIA fees, could be considered to ensure that the fee structure is equitable to all fee payers.

¹⁰ User fee proposals to fund Bay-Delta infrastructure are not unprecedented. The State Water Resources Control Board (SWRCB) Draft Decision 1630 proposed user fees to fund Bay-Delta environmental mitigation projects, and the Central Valley Project Improvement Act enacted user fees to fund fish and wildlife restoration projects and instream flow purchases. However, the SWRCB fee proposal proved to be highly controversial and was rejected by Bay-Delta water users. Under the proposal, water exported to urban areas would have been assessed \$15 per acre-foot, whereas agricultural exports would have been charged \$3 per acre-foot. In-basin urban and agricultural uses would have been assessed \$10 and \$2 per acre-foot respectively. Opponents of this proposal asserted that the fee differentials were arbitrary and did not adequately address equity and cost-responsibility concerns. Developing an equitable fee schedule will be a key element of any fee proposal.

¹¹ Such an "affordability" approach to user fees is supported by the U.S. Environmental Protection Agency (EPA) in *Economic Guidance for Water Quality Standards*, October 1994.

¹² Actual criteria would require more rigorous economic and/or social policy justification than discussed here. The examples are intended to indicate the different dimensions along which a fee schedule could be based.

- ***Where the water is used.*** Water exports and in-basin uses could be charged different fees, for example, depending on how each type of use affected Bay-Delta water quality and fish and wildlife resources.¹³ Likewise, fees could be related to the regional benefits associated with Bay-Delta water consumption.
- ***The time of water use.*** For example, seasonally differentiated fees could be imposed to reflect Bay-Delta flow requirements at different times of the year.
- ***The quantity of water use.*** The fee could increase gradually with water use, as a means of encouraging conservation. This type of “block” schedule could be developed on a user class-specific basis (i.e., separate increasing-block schedules for agricultural, urban municipal, and hydropower uses), and care should be taken to avoid unintended consequences.
- ***What consumer group uses the water.*** Once benefits have been determined, different fees could be charged to agricultural, urban municipal, and hydroelectric uses, depending on equity considerations.

For illustrative purposes, Table 3 displays estimated revenues for a Bay-Delta water user fee under four different fee schedules. For each alternative, the fee would be assessed against annual diversions.¹⁴ Revenue estimates are based on the average annual diversions of the major Bay-Delta water users, as reported by the California Department of Water Resources. The first estimate is based on the SWRCB D1630 fee proposal rejected by Delta water users that differentiated fees according to agricultural versus urban, and in-basin versus export uses, as described in the table. The second estimate maintains a differentiated fee, but reduces the degree of differentiation by lowering the urban fee from \$15 to \$5. The last two estimates charge a uniform fee of \$5/AF and \$3/AF, respectively. Under these different fee schedules, between \$40 and \$70 million in annual revenue could be generated. These estimates are *not* intended to suggest an appropriate fee structure for Bay-Delta water users, but rather to indicate the revenue potential and user impacts of different fee structures. An actual fee policy would require significant research to structure correctly.

¹³ In-basin and export differentials could be based on consumptive use of Bay-Delta water. Whereas both agricultural and urban in-basin uses return some share of allocated water to the Bay-Delta, export uses return Delta water to some other system or the ocean.

¹⁴ Agricultural users have suggested that fees should be assessed against annual consumption rather than annual diversions, because return flows account for a significant portion of their diversions. Because this water returns to the system, it should not be assessed a fee.

TABLE 3
BAY-DELTA USER FEE REVENUE POTENTIAL
Annual Fee Revenue (millions)

SWP	Urban exporter	1.23	\$18.38	\$6.13	\$6.13	\$3.68
SWP	Agriculture exporter	1.23	3.68	3.68	6.13	3.68
CVP	CVP Exchange contractor	3.00	6.00	9.00	15.00	9.00
CVP	Agriculture exporter	7.00	21.00	21.00	35.00	21.00
CVP	Urban exporter	0.70	10.50	3.50	3.50	2.10
Delta Ag Uses	Agriculture in-basin	0.90	1.80	2.70	4.50	2.70
East Bay MUD	Urban exporter	0.18	2.67	0.89	0.89	0.53
San Francisco WD	Urban exporter	0.23	3.38	1.13	1.13	0.68
Contra Costa WD	Urban in-basin	0.03	0.27	0.14	0.14	0.08
Total		14.48	\$67.66	\$48.15	\$72.40	\$43.44

1. Based on average annual diversions, as reported by Department of Water Resources.
2. As proposed by SWRCB D1630: urban exporter \$15/AE urban in-basin \$10/AE agriculture exporter \$3/AE agriculture exchange contractor \$2/AE agriculture in-basin \$2/AE

Flattened Fees

When applying user fees, a combination of flat and variable fees could be adopted. Flat fees are based on the notion that some basic investment level must be made regardless of actual future use patterns. For example, to the extent that the Bay-Delta is used as a conduit for water transfers, some level of transmission infrastructure will have to be maintained regardless of transfer volumes. This is similar to roads, where a minimum quality road must be built to serve any traffic, with road quality increasing depending on quantity, speed, weight, and other characteristics of potential movement. Vehicle registration fees typically serve as the fixed fee to finance basic road infrastructure, with fuel taxes reflecting more variable costs.

Fixed fees frequently vary by customer class. For example, the fixed "demand-charges" paid by electricity and telephone users may differ depending on whether the customer is from the residential or commercial class. Class-specific fixed fees are based on the notion that some customer groups require more expensive fixed investments than others.

A problem with relying solely on fixed fees is that they provide little incentive for efficient resource use, at least over the long-run. Once the entry charge has been paid, the short-run variable cost of using the facility may be negligible. This is often the case with large-scale water infrastructure, where two-thirds or more of typical costs may be considered fixed. As a result, in the long-run, fixed fees can encourage uneconomic consumption and can lead to unnecessary investments in capital-intensive facilities (Hirshleifer, Dehaven, & Milliman, 1960; Kahn, 1988).

Potential Disadvantages of a User-Fee Approach

A Bay-Delta water user fee may be difficult to administer and may be subject to unintended consequences, such as potentially significant evasion rates. As a result, a user fee could necessitate the implementation of new reporting requirements by water users, engendering additional administration and compliance costs. Imposition of an additional charge, even a small one, would likewise act to encourage some users to evade the fee through under-reporting, requiring some fee audit capability by the administering agency.

In addition, in some cases surface water use could be replaced with groundwater. As a result, a fee could encourage greater groundwater use, with concomitant implications to associated aquifers. The ability to substitute ground for surface water depends on the location of water use, with the Sacramento Valley having abundant groundwater supplies, and the San Joaquin Valley facing greater groundwater constraints.

Evidence from other self-reporting fees and taxes indicates that the administrative costs associated with a user fee program could equal 5 percent of total fee revenues, with private sector compliance costs of up to 10 percent of revenues.¹⁵ Likewise, evasion rates could range from as low as 5 percent to as high as 50 percent. Evasion rates appear to be related to the level of the charge being evaded, the effectiveness of the administering agency, and whether or not payers view the fee as being necessary and fair.¹⁶ However, it is important to note that *any* fee or tax will create administrative costs and engender some amount of evasion. For example, the gasoline tax—considered one of the most simple taxes to administer—costs 2 to 3 percent of total revenues to maintain— and evasion rates for income taxes are between 5 and 20 percent.¹⁷

Revenue Sources for Financing Private-Good Benefits

To the extent that private-good project benefits are marketable, they should be self-supporting in the long run. Agricultural and municipal water supply and water supply reliability improvements and hydroelectric power generation are examples of private-good water project benefits. For these project benefits, commodity charges and user fees can be structured to ensure cost share recovery and adequate project cash flow within regulatory and legal limitations.

Revenue sources for private-good-related project costs include commodity charges, connection charges, capital contribution charges, capacity charges, and use fees. Project revenues from marketable private-good outputs can serve to collateralize a variety of short- and long-term revenue-bond-type financing arrangements, including Revenue Anticipation Notes (RANs), enterprise revenue bonds, and installment-sale Certificates of Participation.

¹⁵ M.Cubed, *Truck Tax Policy in Oregon*, Draft Briefing Paper, September 1995.

¹⁶ Ibid.

¹⁷ Memorandum from Bob Pitcher, American Trucking Association, to Warren Hoemann, et al., February 22, 1994.

An Alternative Approach: Statewide Water Utility Surcharge

An alternative method of financing state and local water infrastructure improvements would be the implementation of a statewide water utility surcharge. As with State and local sales taxes, the surcharge would be assessed against the water retailer, who could then pass the charges through to end-users; wholesalers would not be subject to the surcharge so as to avoid double taxation. The surcharge could be applied on a per-acre-foot basis to retail water purchases. Alternatively, the surcharge could be implemented as a fixed fee, similar to existing “hook-up” or “demand” charges (see “Flattened Fees” textbox).

Surcharge revenue could be used to assist with the financing of public-good and common-property benefits associated with Bay-Delta improvements, and/or to provide matching funds and low-interest loans to assist with local project financing — such as improvements in water supply reliability, drainage, and environmental mitigation projects. Care must be taken to accurately apportion these fees to benefits received.

As with a user fee, under the surcharge strategy separate fee schedules could be applied, segmented by geographic area, consuming class, and time and quantity of use. Surcharge variation is supported by the same rationale as would apply to a Bay-Delta water user fee — equity, regional economic impacts issues, and end-user willingness to pay.

Based on statewide agricultural and urban retail water sales of roughly 15 and 7 million acre-feet, respectively, a retail surcharge of \$1.75 per acre-foot would generate approximately \$25 million in annual revenue.^{18,19} Under such a surcharge, urban retail water costs would increase, on average, by less than 1 percent, while agricultural retail water costs would increase by approximately 3 to 4 percent.²⁰ However, even with this relatively modest surcharge, water costs could increase by as much as 15 percent in some agricultural regions.

Surcharges are frequently used to finance infrastructure improvements. Surcharges are imposed on users who may generally benefit from a particular resource, but whose contribution to the investment may not result in direct benefits. For example, states typically assess a motor vehicle tax based on a per-gallon surcharge on unit sales of gasoline and diesel fuel. Although gasoline tax revenues are generally invested in transportation infrastructure, the taxes paid by any given user may be invested in a road system on which that user never relies. For example, rural roads typically do not pay for themselves

¹⁸ For agriculture, retail sales are based on the following assumptions: (1) Annual agricultural demand is 31.1 maf, as per DWR's 1990 average-year demand estimate; (2) 40 percent of total demand is self-supplied groundwater not subject to the surcharge; and (3) 20 percent of the remainder is unaccounted-for water losses not subject to the surcharge. For urban suppliers, retail sales are based on the following assumptions: (1) Annual urban demand is 7.8 MAF; and (2) 10 percent of total demand is unaccounted-for water losses not subject to the surcharge.

¹⁹ Studies of household willingness to pay (WTP) to avoid water shortages have produced WTP estimates ranging from \$169 to \$200 per year. Because a typical household uses approximately one-half to one acre-foot per year, a surcharge of \$1.75 per acre-foot — where surcharge revenue is dedicated to improving the reliability of water delivery systems — would be just a fraction of the estimated residential willingness to pay.

²⁰ This assumes an average cost of \$50 per acre-foot for agriculture.

through fuel taxes and instead are funded by taxes collected by other road users. Yet fuel taxes are generally considered to be fair because everybody benefits from the economic growth engendered by a comprehensive and high-quality transportation system.

As with the Bay-Delta user fee, there would be challenges associated with administering a water surcharge. In some cases (e.g., the city of Sacramento), water is not metered, making it more difficult to pass through the surcharge to end-use customers.²¹ However, it is important to note that the surcharge would be assessed against the retailer, whose total retail consumption is more readily known, and not against individual customers. The retailer could then pass these costs on to its customers, either based on the surcharge formula or following some other approach.

A New Opportunity: Leveraging Water Resources

Local agencies — particularly agricultural water suppliers — may be in a position to leverage their surface and ground water resources to obtain funding for system structural improvements. The negotiated agreement between Metropolitan Water District of Southern California and the Imperial Irrigation District (IID) to transfer water in exchange for improvements to Imperial's system provides the clearest example of this potential. Metropolitan is spending more than \$200 million to pay for IID system improvements and to fund on-farm conservation measures. In return, Metropolitan will secure a 35-year right to the conserved water — some 106,000 acre-feet annually. More recently, Metropolitan has explored similar arrangements with Kern County Water Agency and Arvin-Edison Water Storage District. There is generally thought to be considerable potential to finance conjunctive use agreements in the Sacramento Valley in this manner.

Although infrastructure-for-water transfers often require complex negotiations, they can provide several advantages over cash-for-water transfers. Transfers based on infrastructure improvements that provide additional water supplies (e.g., through conservation) may not result in a net reduction in economic activity by the original water user. In addition, the proceeds of an infrastructure-for-water transfer accrue directly to the local economy in the form of improved local water storage and delivery capability. In contrast, the proceeds of a cash-for-water transfer may only partially accrue to the local economy, depending on whether transfer receipts are invested inside or outside the local economy.

The development of a more active water market in California may also spur new financing opportunities for water resource infrastructure. A fully functional water market may allow local agencies with marketable water to use that water as a source of collateral to secure debt, just as land and other assets are used currently. For example, an irrigation district might be able to use its potential to sell water on the market to secure a loan for conservation

²¹ For utilities that do not meter end-use, this is true of any cost. In these cases, utilities adopt rough cost-allocation methods based on expected customer-class use and base flat fees accordingly.

improvements. Local agencies might also be able to sell a portion of their supply to finance new investments. This approach would be similar to leveraging water supply to obtain financing, as discussed above, except that the district would actually sell a portion of its supply to obtain up-front capital. An active market might also create new opportunities for private financing of infrastructure. For example, the private sector might invest in conservation or water storage facilities in exchange for the right to sell conserved water on the open market. Likewise, the market might highlight investment opportunities for joint projects between two or more local agencies that would otherwise not have strong incentive to cooperate with one another. For instance, two neighboring water storage districts might invest in a groundwater conjunctive use facility to take advantage of seasonal fluctuations in the market price for water.

Summary of Revenue Alternatives

New water-related infrastructure is likely to draw from a variety of funding sources. To the extent possible, project revenues should be linked to project benefits in a manner consistent with a benefits-based approach to project cost allocation. The above discussion considered the following revenue alternatives:

- **Federal Funding** should be obtained to meet the commitments and obligations of the federal government. The State of California should seek federal funding for appropriate water projects and programs. This funding source should be directed towards water projects that produce broad public benefits, including the federal share of CALFED implementation.
- **Bay-Delta General Obligation Bonds** should be directed toward defined public goods. A half-decade of public reluctance to approve GO bonds underscores the need to insure that this financing tool is focused to fund well-defined benefits provided to the public.
- To the extent that GO bonds and other financing sources are not forthcoming to fund public-benefit projects, a broad-based **Bay-Delta User Fee**, agreed to by stakeholders, assessed against diversions from the Bay-Delta and its tributaries could be used to supplement financing for project benefits accruing broadly to those receiving water from the Bay-Delta.
 - A Bay-Delta water user fee could be used to recover the portion of a project's costs that directly benefit those Californians who divert water from the Bay-Delta and/or its tributaries.
 - To address equity concerns, user fees could be structured to account for mitigation payments currently being made by various water users, such as CVPIA restoration fund payments.
 - User fees are commonly used to finance a wide range of public infrastructure — such as ground, air, and water transportation infrastructure — but have been relied on to a much lesser extent for financing water facility costs associated with the provision of public benefits.

- Alternatively, revenue from a statewide **water utility surcharge**, agreed to by stakeholders, could be used to assist with financing public-good and common-property benefits associated with Bay-Delta improvements, and/or to provide matching funds and low-interest loans to assist with local project financing — such as improvements in water supply reliability, drainage, and environmental mitigation projects.
- **To the extent that private-good project benefits are marketable, they should be self-supporting in the long run.** Revenue sources for private-good-related project costs include commodity charges, connection charges, capital contribution charges, capacity charges, and use fees. Project revenues from marketable private-good outputs can serve to collateralize a variety of short- and long-term financing arrangements, including Revenue Anticipation Notes (RANs), enterprise revenue bonds, and installment-sale Certificates of Participation.

California does not lack for water bureaucracies. The state must deal with the U.S. Environmental Protection Agency, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, California Department of Water Resources (DWR), State Water Resources Control Board (SWRCB), and regional water boards. As a result, new water organizations should be created only if absolutely necessary and should be implemented in such a way that enhances the state's capacity to develop and implement effective water policies, not that increases the production of red tape. In this vein, as part of any institutional development process, strategies to eliminate redundancies, streamline bureaucracies, and establish effective processes for legal and financial interactions between water-related organizations must be implemented.

Existing State and local institutions may be limited in their ability to flexibly manage alternative financing approaches (such as user fee or utility surcharge revenues), have missions that are incongruent with broader project purposes, or lack the confidence of project stakeholders. This section considers three alternative institutional arrangements intended to improve the efficacy of water-related infrastructure finance in California. These are a Bay-Delta Financing Authority to coordinate financing for Bay-Delta projects, solicit matching funds from federal and State agencies, and administer Bay-Delta water user fee revenue; a State Water Infrastructure Bank to provide financing assistance to local water agencies, establish a statewide water infrastructure bond pooling program, and administer State water infrastructure grant and loan programs; and private-sector financing and operation of public water service facilities.

Alternative Institutions: A Bay-Delta Financing Authority

Because CALFED recommendations for Bay-Delta infrastructure projects are likely to be phased in gradually, it is important to have in place an organization capable of providing ongoing financial planning to assure an appropriate level

of financing coordination and continuity. Joint Powers Authorities (JPAs) are commonly created to provide this type of financial oversight, coordination, and management for projects conferring multi-regional benefits. Such an organization could be created independently of or in conjunction with the implementation of a Bay-Delta User Fee or utility surcharge. If implemented in conjunction with a user fee, it could be crafted to provide fee payers with greater influence over fee-related investments. Such an authority would be in a position to implement long-term Bay-Delta investment strategies. For purposes of discussion, this authority is referred to as the “Bay-Delta Financing Authority.”

The Bay-Delta Financing Authority could be created as an independent water infrastructure financing agency.²² The Authority could be established so as to operate as expansively or narrowly as conditions require. For example, the Authority could be responsible for developing and implementing capital financing plans based on CALFED recommendations for water supply and environmental issues affecting the Bay-Delta region and for administering any Bay-Delta User Fee revenues. The Authority could be placed under the auspices of a statewide oversight group that would provide review of Authority actions.

The Authority would not develop project proposals, but rather would be charged with evaluating and prioritizing capital proposals consistent with CALFED infrastructure recommendations. Likewise, the Authority could be authorized to enter into agreements with State and federal agencies to achieve specific goals, particularly related to the environment. The Authority could also be authorized to establish water infrastructure franchises in cases where a project is primarily privately financed (e.g., water transport fees) and could potentially develop revenue-raising enterprises related to the Bay-Delta region (see Bay-Delta Port Authority textbox).

If user fees were adopted, the Authority could be responsible for directing fee revenue to specific projects. The Authority could also act on behalf of the State to secure project funding from the federal government and/or other project stakeholders.

The Authority would not be responsible for financing all of the projects contained in its capital plan; rather, its primary funding responsibility would be related to sponsoring infrastructure related to public goods (e.g., habitat improvement projects) and common-property goods. The Authority should allow for Bay-Delta investments sponsored by other parties.

²² Whether or not the Authority should be created under federal or state law would depend on its primary mission. The Central Utah Project Completion Act, which established a commission to plan and expend funds for water conservation and environmental mitigation, is an example of a federally created independent authority.

A Capital Idea

Financing agencies can choose among a number of ways to implement their goals. For example, an agency can finance, construct, and operate specific projects. While this combination of activities can provide organizations with “cradle to grave” control over meeting their goals, it can also act to dilute their focus. An agency expert in financing may be less capable at project management.

Alternatively, financing agencies can focus on developing a capital needs and financing strategy, and contract for actual construction and operating services. Under this rubric, the organization may offer a particular project for bid. In the case of a water financing agency, bid offers could potentially be taken both from private sector entities and public sector agencies that specialize in water infrastructure. An interesting outcome of such an approach would be the federal U.S. Army Corps of Engineers bidding against California’s DWR for the privilege of constructing and managing a water quality mitigation project. Let the best qualified, low-cost bidder win!

Finally, a variation on the competitive bidding approach would be for the financing agency to simply establish a set of goals. These goals could consist of water quality or reliability standards, with specific criteria outlining minimum objectives that must be met. Private and public sector organizations could then be allowed to propose specific projects to meet these goals, whether they involve pouring concrete or implementing conservation measures. The financing agency could then select the best, least-cost proposals to meet its needs.

The Authority could also act as a coordinating body, which could assist with the financing elements of Bay-Delta infrastructure providing private-good benefits. That is, the Authority could allow agricultural and urban interests — as well as public agencies — to pool their resources for specified projects. The Authority could be financed in part by Bay-Delta water user fees as well as by member contributions. Should the Authority invest in revenue-generating projects, these projects could be self-financed but backed by the collective strength of the Authority’s members.

A cooperative structure would provide an additional means to finance common-property needs in the Bay-Delta. For example, enhanced transmission facilities for water markets could provide collective benefits to those using the facilities. Likewise, certain water quality-related projects could confer broad benefits to several agencies. The Authority would give project beneficiaries the ability to coordinate and control infrastructure investments in a complex regulatory environment.

The Authority could also act as a third-party financing agency for revenue-generating projects, issuing bonds on behalf of project sponsors secured by Certificate-of-Participation-like instruments. For example, to the extent that a groundwater conjunctive-use project was ultimately self-supporting, the Authority could provide bond financing to project sponsors, secured by future project revenues.

Rewarding Early Investments

The Authority could also encourage flexible and early financing of Bay-Delta environmental mitigation projects. For example, the Authority could administer a **Mitigation Credit Bank** that would provide financial credits toward long-term Bay-Delta cost obligations to user groups willing to make early investments in the Delta (e.g., Category III projects).

A Mitigation Credit Bank could also provide a vehicle for private-initiative environmental mitigation programs. For example, the Credit Bank could match user groups seeking long-term mitigation credits with local Delta landowners seeking to convert farmland to environmental purposes.²³ A Delta landowner who creates a levee improvement program consistent with CALFED recommendations, for example, could receive financing from a Southern California water utility. In return, the water utility would receive credits toward future project cost liabilities. The role of the Mitigation Credit Bank, in this instance, would be to authorize and facilitate the exchange and to value and issue the credits.

Credits could be given the characteristics of fixed-income securities, specifying a par value, coupon rate, and provision for call.²⁴ An agency purchasing a credit would earn a return against its investment, as specified by the coupon rate. The call provision would determine when the agency could apply its credits plus accrued interest against project payment obligations.

To further encourage early stakeholder funding of Bay-Delta improvements, credits could initially be sold below par value, thereby providing a higher potential return to agencies purchasing credits early. Following the cutoff date, credits could be sold at par value.

Credits could be financed in a number of ways, including through the issuance of State general obligation bonds (e.g., SB 900 could include provisions to fund a credit program); from Bay-Delta user fee revenue; or as part of a comprehensive repayment proposal developed by CALFED.

Structuring a Bay-Delta Financing Authority

The Authority could be governed under a number of different structures, as follows:

- As with existing State-sponsored commissions, the Authority could be managed by a publicly appointed board. For example, the Authority could be composed of voting members nominated by the Governor and confirmed by the State Senate. In this case, an equal number of voting members could notionally represent urban, agricultural, and environmental interests, as well as reflect participation by community-based groups. This

²³ Currently, a number of Delta farmland conversion options are being explored by private landowners, government agencies, and Bay-Delta water suppliers.

²⁴ CALFED is currently working on such a proposal.

structure would be similar to the California Water Commission, which is governed by nine board members nominated by the Governor and confirmed by the State Senate.

- The Authority could be composed of elected members, each of whom would represent a different geographic area. This structure would be similar to transportation districts, such as the Bay Area Rapid Transit (BART) district.
- If fees were also instituted, the Authority could be composed of the fee payers themselves, with votes weighted by the amount of fees paid. This creates an issue regarding people who have an interest in the outcome but are not fee payers. Therefore, some representation would have to be set aside for non-fee payers (e.g., public health interests) or the Authority's public-good activities would have to be directed by other State laws or agencies (e.g., the SWRCB water quality rules, DWR water supply policies, and federal water regulations). This structure would be similar to certain types of special districts, such as Mello-Roos.²⁵

Bay Delta Port Authority

Port authorities are distinct governing entities that finance ship and air ports. Although these authorities are frequently provided grants from related state and local governments — as well as direct assistance from the federal government — ports are typically self-financed through user and other fees. While focusing on providing public-benefit services, ports tend to have private sector management mentalities.

A Bay-Delta Port Authority could be created by combining existing State and local properties — as well as potentially abandoned federal military bases and other lands — in and around the Bay-Delta and placing this territory under the jurisdiction of a single agency. This organization would be responsible for maintaining the economic and environmental integrity of the Bay-Delta. Its operations might be financed through a variety of means, including water user fees, land leases, and water transportation fees.

There are numerous precedents for creation of a Bay-Delta Financing Authority. For example, the California Water Commission's predecessor organizations held statutory authority to administer specific water revenue programs. The California Transportation Commission provides advice and oversight of statewide transportation infrastructure investment. This Commission also allocates infrastructure financing, principally from general obligation bonds secured through ballot initiative. The California Energy Commission provides limited statewide capital financing for energy projects, financed by an energy surcharge.²⁶ Likewise, the existing CALFED process could provide a basis for a more formal and expansive Bay-Delta Financing Authority.

²⁵ Special districts represent one kind of government organization that provides local taxpayers with greater authority over collective resources while maintaining the integrity of any fees collected. See for example M.Cubed, *Market-Based Approaches to Achieving Air Quality Goals in California*, July 1994.

²⁶ In 1984, the Assembly Office of Research proposed the creation of a California Public Improvements Authority (CPIA) to administer overall infrastructure investments in the state, including serving as a bond pooling agency for local governments. The CPIA would have been led by a five-member board consisting of the State Treasurer, Director of Finance, State Controller, and two members appointed by the Speaker of the Assembly and the President pro Tempore of the State Senate.

If well-implemented, the Authority could provide a single coordinating body that would have the ability to develop and finance long-term water infrastructure capital plans. As a result, it would be well-positioned to break the existing infrastructure logjam.

Alternative Institutions: A State Water Infrastructure Bank

More than a dozen states operate bond banks to assist local agencies with publicly financed infrastructure improvements. California has contemplated creating an infrastructure bank of one form or another for at least a decade. For example, in 1984, the Assembly Office of Research proposed the creation of the California Public Improvements Authority to consolidate the State's capital budgeting processes and to provide a mechanism for prioritizing local assistance programs. In 1987, the State Senate Local Government Committee considered action to establish a California Bond Pooling Authority, which would have provided a mechanism to consolidate local bond issues to reduce financing costs.

Though statewide water policies will necessarily entail considerable investment in local-level water infrastructure, some local water agencies are finding it increasingly difficult to access capital markets or obtain affordable financing for new projects. Local agencies are facing a combination of sharply higher supply costs, restricted access to tax revenues, reduced water sales revenues, and an increasing degree of regulatory uncertainty, each of which can affect perceived credit worthiness and make project financing more costly.

Small agricultural water districts in particular are under increasing financial pressure. Irrigation district debt is considered the "most vulnerable ...debt in the California Central Valley region" by at least one major bond rating agency.²⁷ Widening capital access and improving loan terms for local agencies are necessary first steps if these agencies are to undertake needed investments in conservation, reclamation, and drainage control.

Although many projects can generally obtain financing, an infrastructure bank may be able to address several weaknesses in the existing financing system. For example, as discussed earlier, financing for projects conferring mostly public-good benefits may prove elusive because of free-ridership and other associated problems. An infrastructure bank, financed through a combination of general tax revenue and water surcharges, could serve to help pay for cost-effective, public-benefit projects that cannot be easily financed solely through the municipal bond market.

²⁷ Moody's Investor Services, 1991.

Potential Advantages of Pooled Financing for Local Projects

Bond issuance and interest costs for smaller-scale capital projects in particular can be prohibitive. One way to reduce these costs is to use a JPA arrangement to pool a number of small bond offerings into a single financing arrangement. Pooling allows local agencies to share debt issuance costs and realize scale economies in the municipal bond market. Existing pooling arrangements (see textbox on Local Assistance), however, are limited in their scope and resources. In response to growing local investment needs, the State could consolidate and expand local assistance programs into a comprehensive water infrastructure bank. The bank would provide financing assistance, loans, grants, and bond pooling services to local agencies for water supply, conservation, drainage, and environmental mitigation infrastructure projects. The bank would achieve capital cost savings for local agencies by reducing debt-related overhead costs and using the State's credit to gain wider access to capital markets.

For example, according to a study by Kidder, Peabody, and Co., a State bond bank could reduce a local agency's annual debt costs for a 20-year bond by up to \$10,000 per million dollars issued for small-scale financing — e.g., total debt costs for a \$2 million, 20-year bond might be reduced by approximately \$400,000. Moreover, the bank would provide local agencies a degree of assurance that investment funds would be available when needed to initiate cost-justified projects.

A water infrastructure bank could serve to coordinate existing and future State water resources loan and grant programs. State financial assistance could be based on several considerations — including local need, community wealth, ability to repay, importance of the project with respect to public health or safety, and impact on the environment or economy. The bank also would be able to help low-wealth or high-risk areas (such as agriculturally dependent regions) leverage available local funds by matching them with low-interest loans.

A water infrastructure bank could be administered by an existing agency, such as the Department of Water Resources, or as a separate authority. To the extent that the bank provided loans and grants, it would require initial seed money — such as from a general fund appropriation or GO bond proceeds.²⁸ Alternatively, revenue from a statewide utility surcharge (as discussed above) could be used to fund the bank on an ongoing basis.

²⁸ A state water resources revolving loan fund has recently been proposed (Senate Bill 776) to provide loans to local agencies to aid in the construction of local water supply projects and to aid in the funding of voluntary, cost-effective capital outlay water conservation programs and groundwater recharge facilities. As proposed in draft legislation, the program would be funded through a State GO bond issue and administered by the Department of Water Resources. Senate Bill 900 would also provide funding for loans to local agencies for conservation and groundwater management projects. Loans would be funded through a State general obligation bond issue.

Local Assistance

Current water-related local assistance programs fall into three categories: (1) technical assistance programs, (2) bond pooling programs, and (3) grant and low-interest loan programs.

Financing Assistance Programs

Financing assistance programs provide advisory services to local agencies preparing capital repayment plans or debt issues. There are two State-run financing assistance programs available to local water agencies in California. The California Debt Advisory Commission (CDAC) is the State's clearinghouse for public debt issuance information. The primary mission of the CDAC is to assist public agencies with the monitoring, issuance, and management of public debt. The California Department of Water Resources Division of Local Assistance also provides technical assistance to local water suppliers preparing debt issues.

Bond Pooling Programs

The Association of California Water Agencies (ACWA) operates the Pooled Financing Program that offers municipal and agricultural districts opportunities to pool several bond issues for small-scale capital projects into a single, more cost-effective issue. The Financing Authority for Resource Efficiency of California (FARECal) offers a similar program directed toward energy and water conservation investments. These programs help local agencies reduce debt issuance and interest costs by realizing economies of scale in the municipal bond market.

Low-Interest Loan and Grant Programs

The State administers a number of grant and low-interest loan programs designed to assist local agencies with water supply, conservation, and wastewater treatment investments. These programs are generally funded from State GO bond proceeds.²⁹ Loans are repaid to the general fund. Programs operated by DWR include the California Safe Drinking Water Bond Law (approximately \$8 million available) and the Water Conservation Bond Law of 1988 (approximately \$20 million available). Programs operated by the SWRCB include the Clean Water and Water Reclamation Bond Law of 1988 (no funds available), the Agricultural Drainage Water Management Loan Program (no funds available), the Water Reclamation Loan Program (approximately \$26 million available), and the State Revolving Loan Fund (for wastewater treatment projects). Limited funds remain for most State-administered loan and grant programs and future funding is highly uncertain.

Potential Disadvantages of Pooled Financing for Local Projects

A bond bank approach would not represent a solution to financing infrastructure for all local water suppliers. There are two notable disadvantages to this approach that could significantly limit its effectiveness. The first concerns the loss of local control over financing local infrastructure. To some degree, a bond bank would require participants to yield some of their autonomy in structuring project financing. For example, a bond bank requires participants to coordinate debt issuance, which frequently results in project timing problems; participants needing more time to act may end up being dropped from the pool, and those that are delayed by others may end up pulling out of the pool and

²⁹ An exception is the Environmental License Plate Fund, which provides cash grants of up to \$3 million for a variety of projects aimed at preserving or protecting California's environment and is funded by the sale of personalized license plates.

financing independently. Participation may also be limited to the extent that potential participants do not wish to be associated with one another. To the extent that the bank attracts high-credit risk participants, lower-risk candidates will resist joining the pool, thus eroding the potential benefits of pooling. Local entities may be required to use professional services of the bond pooling entity rather than people with whom they have established relationships. Each of these factors represents a loss of local control over structuring the financing. To the extent that local entities value this control, a bond pooling approach will be less attractive.

Second, bond pools are like insurance pools in that they may attract a disproportionate share of high-risk participants — i.e., bad projects. In the insurance industry, this is referred to as adverse selection. One of the principal advantages of a pooling arrangement is the spreading of risk to improve credit terms. To the extent that adverse selection undermines this advantage, the benefits of pooling will be reduced and participation will suffer.

As access to public capital shrinks, state and local governments are increasingly considering “privatization” as a mechanism to focus private sector capital and expertise on public needs. A growing body of evidence suggests that under certain circumstances local agencies may be able to more cost-effectively finance and operate new infrastructure by harnessing private sector initiative.

Privatization occurs when the private sector finances, designs, constructs, and/or operates a public service facility (Beecher, et al., 1993). While the potential benefits of privatization appear to be significant, it is important to note that there is fairly limited actual experience with privatizing the provision of public services in California. Although privatization initiatives are popular throughout the world, the experiences of other states or countries may not be reflective of what would occur in California.

Potential Advantages of Privatization

Privatization proponents argue that as a rule private sector businesses operate more efficiently than public sector agencies. Faced with competitive pressures, such as shareholder interests, acquisition threats, or the risk of bankruptcy, private sector businesses must continually work to operate and invest efficiently, as well as to continually innovate the way they do business. These competitive pressures, in theory, encourage lower service costs. There is some empirical evidence to support this assertion. For example, a recent comparative study of a sample of investor-owned and municipally operated water utilities in California found the following:

- The investor-owned utilities provided comparable water service to consumers at the same price as the public agencies, even though they paid taxes and did not receive non-operating income, such as property tax revenue.

- Even though public agencies may issue tax-exempt debt, it was found that the investor-owned utilities had comparable or lower capital costs.
- It was found that the investor-owned agencies had substantially lower operating costs per unit of service than the public agencies.

A comparative study of private- and public-sector performance in five countries reached similar conclusions.³⁰ It found that, relative to the private sector, a public-sector entity providing a public-service good was more likely to:

- innovate and adopt cost-effective practices more slowly
- realize lower rates of return on capital
- realize higher operating costs
- set prices below imputable cost
- overcapitalize and
- favor voters over non-voters (e.g., future generations).

Privatization may also offer local agencies opportunities to pursue joint projects (Beecher, et al., 1993; Hardten, 1984). For example, local agencies can contract with the private sector to provide a new supply source, treatment facilities, or additional distribution facilities. Privatized joint projects may help local agencies realize both scale economies and lower construction and/or operating costs associated with private sector development and operation.

Local agencies are also increasingly turning to leasing arrangements with the private sector to provide essential services. Leasing can allow local agencies to construct new facilities more quickly, free up capital funds for other uses, and reduce the risks associated with owning plant and equipment (Klein, 1989).

Regulatory agencies are beginning to recognize the potential benefits of privatization approaches. The U.S. Environmental Protection Agency, for example, has made privatization options a cornerstone of its recommended approach to financing regulatory compliance. EPA believes that well-structured public-private partnerships offer local agencies opportunities to mitigate the rising costs of environmental compliance (U.S. Environmental Protection Agency, 1990b). As shown in Table 4, public-private partnerships can be structured to accommodate varying degrees of public and private-sector involvement, including contracting for services, "turnkey" agreements, developer financing, and full-scale privatization of public services. Table 5 provides a sample of more than a dozen private-public partnerships providing water and wastewater services that have been successfully formed throughout the country.³¹

³⁰ See "Comparing the Efficiency of Private and Public Production: The Evidence from Five Countries," NAWC Water 30 (Summer).

³¹ For example, see (U.S. Environmental Protection Agency, 1989).

Potential Disadvantages of Privatization

The potential gains of privatization must be weighed with the possible risks. While generally improving the operating efficiencies of publicly operated water systems, privatization may result in the loss of services that customers value. For example, several consumer and environmental advocacy groups have voiced the concern that the restructuring of California's electric utility sector toward greater market competition will result in the discontinuation of demand-side-management programs, not because they are not cost-effective from a total resource perspective, but because they may not directly benefit a utility's short-term bottom line. In general, to the extent that publicly owned water suppliers are more inclined or more able than investor-owned water suppliers to invest in projects and programs with widespread public benefits, privatization will decrease these investments.

A policy of privatization also must be accompanied with adequate market regulation. Water suppliers are natural monopolies with mostly captive customers. As the privatization of electric and water utilities in Great Britain has demonstrated (see textbox), privatization without necessary market rules can result in the abuse of monopoly power.

TABLE 4
POSSIBLE PUBLIC-PRIVATE PARTNERSHIPS

Contract services	The private sector provides contracted services, such as operation of a wastewater treatment plant. The public sector retains ownership of plant and equipment.
Turnkey agreement	The private sector designs and constructs the public-sector facility. The private sector assumes performance risk while the public sector assumes financing risk. The public sector may also contract with the private sector to operate the facility.
Developer financing	The private sector finances the construction or expansion of a facility — such as a water treatment plant — needed to support a proposed development.
Privatization	The private sector owns, constructs, and operates a facility. The public sector contracts with the private sector for service.
Merchant facility	The private sector owns, constructs, and operates a facility and markets facility services to the public sector.

Source: (Beecher, et al., 1993)

TABLE 5
EPA PUBLIC-PRIVATE PARTNERSHIP SUCCESS STORIES

Sabine Parish, LA	Contract services	Public water supply system
Belen, NM	Developer financing	Private water supply system
Irving, TX	Contract services	Development of wells
York County, PA	Privatization	Acquisition of public system
Littiz, PA	Contract services	Public water system
Westmoreland County, PA	Contract services	Public water system
Myrtle Beach, SC	Turnkey contract	Public water system
Auburn, AL	Privatization	Wastewater treatment plant
Chandler, AZ	Privatization	Wastewater treatment plant
Escondido, FL	Developer financing	Sewer access rights
Orlando, FL	Developer financing	Impact fees
Mount Vernon, IL	Turnkey contract	Wastewater treatment plant
Clinton, KY	Turnkey contract	Wastewater treatment plant
Edgewater, NJ	Turnkey contract	Wastewater treatment plant
Hood River, OR	Contract services	Wastewater treatment plant

Source: Adapted from Beecher (1993)

The British Experience

Concerted efforts to privatize much of Great Britain's utilities industry began in the late 1970's. These efforts culminated in a wave of privatization during the latter half of the 1980's. By the early 1990's, most of Great Britain's water, energy, and telecommunications utilities had been turned over to the private sector. Privatization has been largely credited with the turnaround of several noteworthy British firms, including British Airways PLC, British Steel PLC, and British Telecommunications PLC, once considered among the most inefficient of state-owned monopolies. Despite these successes, British privatization has had a number of unexpected consequences, most notably, soaring profit margins and executive compensation packages and rapidly rising prices for water and electricity utility services. Critics and proponents of privatization generally agree, however, that the British experience does not argue against privatization, but rather highlights the consequences of a poorly crafted regulatory model. Britain is now revisiting the question of how best to regulate investor-owned utilities without sacrificing the market incentives that have been largely credited with improving the performance of Britain's public utilities.

Summary of Alternative Institutions for Infrastructure Financing

Alternative institutional arrangements to facilitate the financing of water-related infrastructure include:

- A **Bay-Delta Financing Authority** could be established to coordinate financing for Bay-Delta project costs related to public and widely shared benefits, solicit matching funds from federal and State agencies, and administer any Bay-Delta water user fee revenue. The Authority could also provide a mechanism to facilitate and coordinate the work of existing agencies.
 - The Authority could act as a coordinating body, allowing agricultural and urban interests — as well as government agencies — to pool their resources to fund projects that provide shared and public benefits. This approach could give agencies that are funding project improvements in the Delta greater financial control over project funds.
 - The Authority could also include provisions for crediting near-term investments in Bay-Delta improvement projects against long-term project cost liabilities.
 - The Authority could be placed under the auspices of a statewide oversight group, representative of the diversity of water interests, to provide general management and review of Authority actions.
 - As CALFED recommendations for infrastructure projects in the Bay-Delta will be phased in gradually, the Authority could be in a position to provide ongoing project financial planning to assure an appropriate level of financing coordination and continuity across projects.
- A **State Water Infrastructure Bank** could be created to coordinate and consolidate existing water-related State local assistance programs. The Bank would most appropriately focus on public-goods benefits that are not readily revenue-financed. Such consolidation could streamline government programs, reduce bureaucracy, and improve access to capital.
 - The Bank should be developed only after an audit of existing loan and grant programs has been completed to ensure the effectiveness of such programs.
 - The Bank could provide technical assistance, loans, grants, and bond pooling services to local public and private water service providers for water supply, conservation, drainage, and environmental mitigation capital projects.
 - The Bank could achieve capital cost savings for local water service providers by reducing debt-related overhead costs and using the State's credit to gain wider access to capital markets. Moreover, the Bank could

provide local agencies a degree of insurance that capital funds would be available when needed to initiate cost-justified projects.

- The Bank could establish project funding criteria to allocate limited State funds. Criteria could include project importance with respect to public health and safety, project impact on the environment and/or economy, community wealth, and ability to repay project loans.
- The Bank could be operated under the auspices of an existing State agency, such as the Department of Water Resources, the Department of Finance, or the Debt Advisory Commission.
- Several approaches could be harnessed to finance an Infrastructure Bank. For example, GO bonds, user fees, or water utility surcharges on agricultural and urban retail water sales could be used to support Bank activities.
- A **Blue Ribbon Commission on Water Industry Restructuring** should be appointed by the Governor to further study the operating and capital efficiencies that could be realized through appropriate restructuring of public services. As part of its charge, the Commission should establish guiding principles for the transfer of public assets to local entities and the private sector where such transactions are determined to be in the public interest. The Commission should also study both the ability to use State and federal water transmission facilities as common carriers to facilitate water transfers and any efficiency improvements in water allocation that could be gained from this approach.

- Barakatt & Chamberlin, (1994). The Value of Water Supply Reliability: Results of a Contingent Valuation Survey of Residential Customers. California Urban Water Agencies.
- Beecher, J.A., Mann, P.C., & Stanford, J.D. (1993). *Meeting Water Utility Revenue Requirements: Financing and Ratemaking Alternatives*. The National Regulatory Research Institute.
- California Department of Water Resources (1993). California Water Plan Update.
- Haarmeyer, D. (1992). "Farmington Turns Over Entire Water System: Big Savings for a Small Town." *Privatization Watch* 190.
- Hardten, R.D. (1984). "Developing Joint Water Projects." *American Water Works Association Journal* 78 (February): 41-46.
- Hirshleifer, J., J.C. Dehaven, et al. (1960). *Water Supply: Economics, Technology, and Policy*. Chicago, IL, University of Chicago Press.
- Kahn, A. (1988). *The Economics of Regulation: Principles and Institutions*. Cambridge, MA, The MIT Press.
- Klein, R. (1989). "Utility Leveraged Leasing: Strengths and Weaknesses." *Public Utilities Fortnightly* 124 (August): 22-28.
- McReynolds, Z. (1995). CALFED Bay Delta Program: Financing Overview. CALFED Bay Delta Program.
- Misczynski, D.J. (1992). "Financing regional infrastructure in times of fiscal fundamentalism." *California Policy Choices* Vol. 8 (1992): p. 127 -150.
- National Water Education Council (1992). Cause for Concern: America's Clean Water Funding Crisis. National Water Education Council.
- Schnare, D.W. and J.E. Cromwell (1990). *Capital Requirements for Drinking Water Infrastructure*. AWWA Seminar Proceedings: Capital Financing, Denver, AWWA.
- Smith, R.T. (1985). *Troubled Waters: Financing Water in the West*. Washington DC, The Council of State Planning Agencies.
- U.S. Environmental Protection Agency (1989). *Public-Private Partnership Case Studies: Profiles of Success in Providing Environmental Services*. Washington, DC, U.S. Environmental Protection Agency.
- U.S. Environmental Protection Agency (1990). Environmental Investments: The Cost of a Clean Environment. U.S. Environmental Protection Agency.
- U.S. Environmental Protection Agency (1990). *Public-Private Partnerships for Environmental Facilities: A Self-Help Guide for Local Governments*. Washington, DC, U.S. Environmental Protection Agency.

This document is intended only as an informal aid to readers of this publication and includes descriptions that should not be considered comprehensive or legal definitions.

Anadromous fish	species like salmon that migrate from fresh water streams to the ocean and back during their life cycles
CALFED	10 California and federal agencies with management and regulatory responsibility in the Bay-Delta, working together under a June 1994 Framework Agreement to develop long-term solutions to Bay-Delta problems and to coordinate State Water Project and Central Valley Project operations with regulatory requirements
Category III	a section of the December 1994 Bay-Delta Accord (or Agreement) that recognizes that several non-outflow factors (e.g., unscreened diversions) affect Bay-Delta water quality and that commits the signatory agencies to dedicate funds to help fund up to \$60 million/year to address those factors
Central Valley Project (CVP)	federally owned project consisting of numerous dams, canals, and other water infrastructure built beginning in the 1930's to manage water flows on the Sacramento and San Joaquin Rivers and many of their tributaries
Conjunctive use	the planned use and storage of surface water in conjunction with groundwater to improve water supply reliability, including the use of reclaimed/recycled and imported water or artificial groundwater recharge
Conservation	measures that reduce consumption and waste; in agriculture, can include new irrigation systems, new cropping patterns and reducing drainage that cannot be recycled or reclaimed; in urban use, can include low-water-use landscaping, low-flow toilets, sinks and showers, increased industrial water-use efficiencies

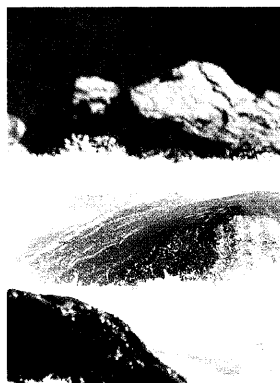
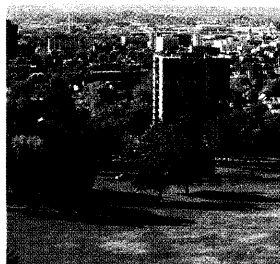
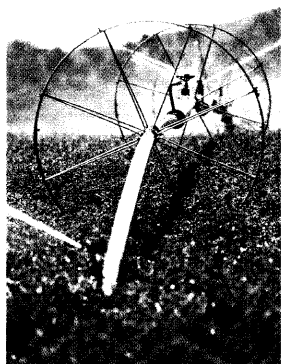
Contract rights	contractual rights to obtain water from holders of appropriative rights; numerous water districts contract with the State of California and the U.S. Bureau of Reclamation for water through the State Water Project and Central Valley Project, respectively
CVPIA	the Central Valley Project Improvement Act of 1992, which mandated significant changes in CVP operations, including allocating additional water supplies for fish, wildlife, and habitat protection/enhancement and permitting transfer of CVP water outside its service area
CVPIA restoration fund	\$50 million/year habitat restoration fund authorized in the CVPIA; funded by fees on CVP contractors and federal and State appropriations
Fish screening	placing screens to prevent fish from being drawn into pumps and other diversions of water from its natural flow
Groundwater	water that has seeped beneath the earth's surface and is stored in the pores and spaces between particles/layers of sand, gravel and clay or is trapped within hard rock formations; California groundwater is largely unregulated
In-basin use	use of water that does not entail exporting water out of the basin or watershed in which it naturally occurs
Instream use	use of water within a stream such as provision of habitat, fishing, recreation and scenic beauty
Joint powers authority	a public agency, established under California law and comprised of officials of other public agencies, having the authority to issue revenue bonds and operate and maintain water projects for the member/participating agencies
Land fallowing/retirement	leaving usable farmland unplanted on a temporary or permanent basis

Non-point-source pollution	pollution coming from a non-specific source such as runoff from city streets, agricultural fields, construction sites and abandoned mines
Peripheral Canal	proposed isolated (not integrated with nearby waterways) canal to divert water from Northern California around the Bay-Delta to the California Aqueduct and/or Delta-Mendota Canal and Southern California; defeated by voters in June 1982
Point-source pollution	pollution coming from a specific identifiable source such as a factory
Reclaimed/recycled water	wastewater or previously used irrigation water treated and managed for secondary use
Salvaged water	water of unacceptable quality as a result of a prior use that is treated to permit its reuse
State Water Plan	report issued by the Department of Water Resources, most recently updated in December 1994, that reviews how population growth, land use, and water allocations for environmental needs affect water resource management and analyzes options for meeting California's water supply and demand needs to 2020
State Water Project (SWP)	state-owned and operated water project consisting of 22 dams and reservoirs that delivers water from the Sacramento Valley to Southern California
Surface water	water that remains on the earth's surface in rivers, streams, lakes, reservoirs or oceans
Transferee	the party to which water is transferred
Transferor	the party that transfers water to another
Water exports	transfers of surface or groundwater out of its basin of origin or natural streambed
Wheeling	using the water supply facilities of one entity to transport water, the rights to which are held by another entity, for a fee

Maintaining Momentum On California Water Issues: Business Leaders' Findings

May 1996

Financing Options for Water-Related Infrastructure in California



SPONSORED BY

California Business Roundtable
415/772-0991



California Chamber of Commerce
916/444-6670



California Farm Bureau Federation
916/924-4000



California Manufacturers Association
916/441-5420

